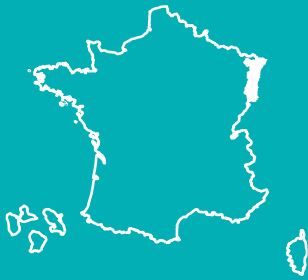


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Manager

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Françoise Le Bohec-Dorner (IE)
Alessandra Maia-Grondard (IR)

Analytical capacity

UHPLC-MS : 9000 analyses/year
GC-MS : 1500 analyses/year

Funding

ANR
INRAE/CNOC, Dpt BAP
Université de Strasbourg
CNRS (IBMP de Strasbourg)
CPER / MESRI
Région Grand Est
Colmar Agglomération
Union Européenne (Feder)

Mission and objectives

For several years now, the UMR Santé de la Vigne et Qualité du Vin (SVQV) has been conducting a breeding program aimed at creating grapevine varieties (*Vitis vinifera*) that produce high quality wines and have natural, long-lasting resistance to several grapevine diseases, by exploiting sources of resistance from wild grapevine species. This breeding program is based on work aimed at understanding the basis of vine resistance to pathogens and on the study of factors determining wine quality. The creation of new grape varieties must meet two imperatives:

- obtain durable resistance to the main vine pathogens
- ensure the impeccable quality expected of French wines.

In line with these imperatives, the UMR has recognized expertise in analytical chemistry, and boasts high-performance analytical equipment dedicated to characterizing grapevine metabolism, in support of the unit's research projects. These projects currently focus on two types of metabolites: grape and wine aromas, and grapevine defense metabolites. At the same time, this analytical platform is also at the heart of numerous national and international collaborations on different plant models. The platform specializes in targeted and non-targeted metabolomics analyses, associated data processing, characterization and identification of molecules of interest.

Organization

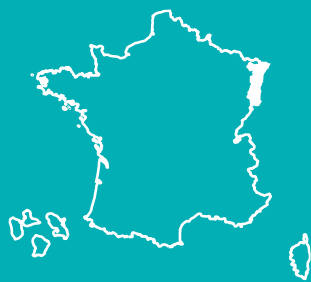
The platform, managed by the Grapevine Genomics and Metabolism (GMV) team, is organized into two subsets dedicated respectively to gas chromatography (GC) and liquid chromatography (LC) coupled with mass spectrometry (MS). This equipment enables both targeted and non-targeted metabolomics analyses to be carried out.

1. GC-MS and olfactometry equipment : The platform is equipped with two GC-MS instruments fitted with "Multi Purpose Sampler" automatic injector/samplers, enabling fully automated implementation of solid phase micro-extraction (SPME) and "Stir Bar Sorptive Extraction" (SBSE) techniques, as well as olfactometry for characterizing grape and wine aromas.
2. LC-MS equipment : A Thermo Vanquish UHPLC (Ultra High Performance Liquid Chromatography) chain is coupled to a Thermo Exploris 120 high-resolution mass spectrometer. This spectrometer, based on Orbitrap technology, provides very high mass accuracy. It can be fitted with either an electrospray ionization (ESI) source or an atmospheric pressure chemical ionization (APCI) source.



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The platform is at the heart of numerous national and international collaborations and partnerships. The main partners benefiting from the platform's analytical resources within the framework of services or collaborations are :

- Comité Champagne
- Université du Littoral Côte d'Opale (M. Magnin-Robert)
- Junia (A. Siah)
- IRHS d'Angers (M. Briard, E. Geoffriau)
- Agrocampus Ouest (Maria Manzanaras)
- ISVV de Bordeaux (E. Gomès, P. Darriet)
- Université de St Etienne (S. Baudino)
- Université de Haute-Alsace (J. Chong)
- Université de Karlsruhe (Allemagne) (P. Nick)
- Université de Freiburg (Allemagne) (P. Beyer)



Recent results

Thanks to its high-performance equipment and the expertise of its staff, the analytical platform has played a decisive role in several of the unit's major publications and achievements:

- Olazuaga et al. (2023). Metabolic consequences of various fruit-based diets in a generalist insect species. *eLife*, 12, e84370,
- Plomion et al. (2018) Oak genome reveals facets of long lifespan. *Nat Plants* 4, 440-452. doi: 10.1038/s41477-018-0172-3.
- Magnard et al. (2015) Biosynthesis of monoterpene scent compounds in roses. *Science* 349: 81-83. (Fig.1)
- Duan et al. (2015) Genetic diversity of stilbene metabolism in *Vitis sylvestris*. *J Exp Bot* 66: 3243-3257.
- Guillaume et al. (2013) Genetic analysis of the biosynthesis of 2-methoxy-3-isobutylpyrazine, a major grape-derived aroma compound impacting wine quality. *Plant Physiol* 162: 604-615
- Hugueney et al. (2012) **Brevet international** Génoplate-Valor WO2012/052171: « 1-deoxy-D-xylulose 5-phosphate synthase alleles responsible for enhanced terpene biosynthesis » (Fig. 2)

Fig.1
Science
03/07/2015



Fig.2
Rapport
annuel Inra
2015

